Health by Numbers

Rhode Island Department of Health
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Office of Health Statistics
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Vol. 5, No. 11 November 2003 Edited by Jay S. Buechner, PhD

Deaths and Injuries from Structure Fires in Rhode Island

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The Station fire that occurred on February 20, 2003, was a uniquely tragic event in Rhode Island, taking 100 lives and severely injuring many of the estimated 300 or more patrons who survived the fire.[1] Prior to that fire, the pattern of deaths and injuries from structure fires in the state was fundamentally different, characterized by small numbers of deaths and injuries per year, occurring mostly in residential fires, and involving persons over the full age spectrum. This report presents summary data on the state's experience from 1990 through the most recent years for which data on deaths and hospitalizations have been analyzed.

Methods. Deaths occurring in Rhode Island from fires in structures during the period 1990-2000 were identified from death certificate data according to underlying cause of death codes.[2,3] (Table 1) Deaths were classified by injury intent (unintentional, homicide, undetermined), and, where the coding allowed, unintentional deaths were classified as residential or non-residential fire deaths. Hospitalizations in Rhode Island (excluding those discharged dead) that were due to fires in structures during the period 1990-2001 were identified from hospital inpatient discharge data according to external cause of injury codes. (Table 1) Hospitalizations were likewise classified by injury intent (unintentional, assault, undetermined), and unintentional fire injuries were classified as residential or non-residential.

Overall and age-specific death and hospitalization rates were calculated based on 2000 Census data for Rhode Island. The socioeconomic status (SES) of fire victims in both databases was approximated as poverty, low, middle, or high based on their census tract of residence and an analysis of 1990 Census data for Rhode Island census tracts.[4]

Results. There were 83 deaths due to fires in structures during 1990-2000, an average of fewer than eight deaths per year, and 130 hospitalizations for non-fatal fire injuries during 1990-2001, an average of fewer than 11 cases per year.

For both deaths and hospitalizations, most of the causative events were unintentional, 86.8% of deaths and 85.3% of hospitalizations. (Figure 1) Of the 51 unintentional fire deaths for which the burned structure was classified, all were private residences. Of the 111 hospitalizations due to fires from unintentional causes, 93 (83.8%) resulted from fires in private residences. Smaller proportions were due to intentional assaults or due to events where intent to injure was not determined.

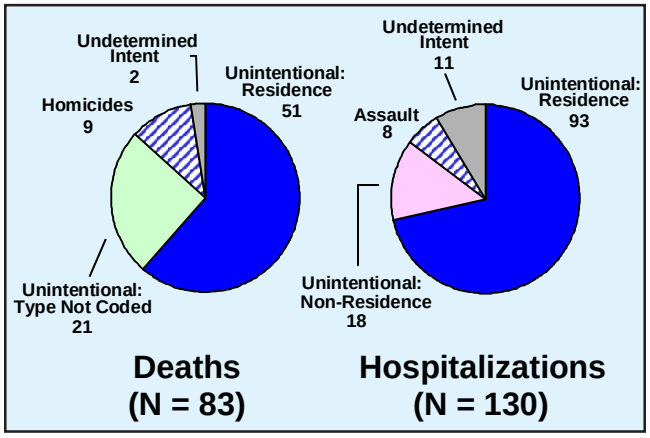

Figure 1. *Deaths and hospitalizations for non-fatal injuries from structure fires, by injury intent and type of structure, Rhode Island, 1990-2000 (deaths) and 1990-2001 (hospitalizations)*

Table 1. Analytic Groupings Based on Underlying Cause of Death Codes and External Cause of Injury Codes

Injury Intent	Type of Building	ICD-9 Code*	ICD-10 Code*
Unintentional	Residential	E890	
	Non-residential	E891	
	Type Not Coded		X00
Assault/Homicide	Type Not Coded	E968.0	X97
Undetermined	Type Not Coded	E988.1	Y26

*ICD-9 codes were used with all hospitalization data and with death data through 1998. ICD-10 codes were used with death data from 1999 on.

Males were the majority among both those killed and those injured non-fatally in structure fires. Of deaths, 52 (62.7%) were males; of hospitalizations 75 (57.7%) were males. Death and hospitalization rates were relatively high for both the youngest and oldest age groups in the population, but hospitalization rates were also high for persons ages 25 – 44 years, for whom death rates were the lowest of all age groups. (Figure 2)

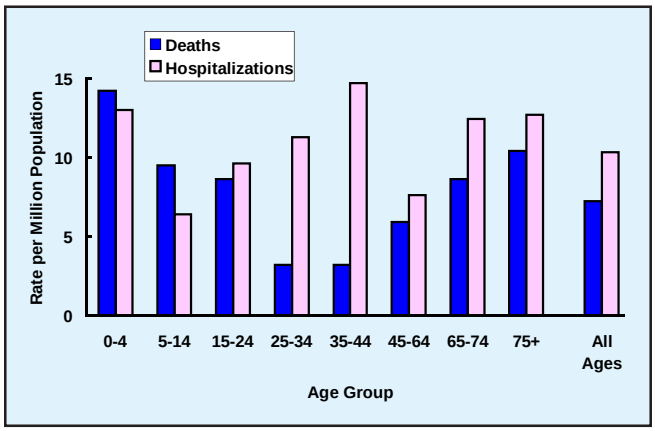

Figure 2. *Average annual rates of death and of hospitalization for non-fatal injuries from structure fires per 1,000,000 population, by age group, Rhode Island, 1990-2000 (deaths) and 1990-2001 (hospitalizations)*

Rates of death and hospitalization due to structure fires were highest among persons who lived in the 41 census tracts in the state designated as poverty SES areas using 1990 Census data. (Figure 3) These tracts are located primarily in the inner city areas of Providence, Pawtucket, Central Falls, Woonsocket, and Newport. Rates for those living in middle and high SES tracts were lower than the state average, and rates for those living in low SES tracts were intermediate between the two extremes.

Discussion. During the decade prior to the Station fire, most deaths and injuries from structure fires in Rhode Island were associated with residential fires where the number of victims in each occurrence was small. There were victims of both sexes and all ages, as well as throughout the spectrum of socioeconomic status. However, males, very young and very old persons, and those who live in poverty areas are at elevated risk for fire injury and death.

Nothing in the pattern of such fires and their resulting injuries and deaths was predictive or suggestive of the cataclysmic event the state experienced earlier this year. For emergency response planning, the lesson is clear – we must plan for events that we cannot anticipate based on our own limited historical surveillance data. We must expand the scope of our attention to include the experience of other areas, both national and international, and other times, and especially to include a realm of possible events that may surpass any experience to date.

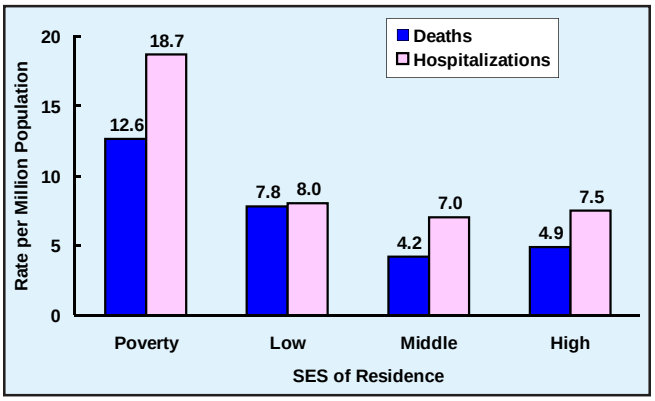

Figure 3. *Average annual rates of death and of hospitalization for non-fatal injuries from structure fires per 1,000,000 population, by SES of census tract of residence, Rhode Island, 1990-2000 (deaths) and 1990-2001 (hospitalizations)*

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2. Public Health Service and Health Care Financing Administration. *International Classification of Diseases, 9th Revision, Clinical Modification, 6th ed.* Washington: Public Health Service, 1996.
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Originally published in the November 2003 issue of Medicine & Health / Rhode Island

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